



# MAGAZINE

PRICE TWOPENCE

DECEMBER 1957





The *I.C.I. Magazine* is published for the interest of all who work in I.C.I., and its contents are contributed largely by people in I.C.I. It is edited by Sir Richard Keane, Bt., and printed at The Kynoch Press, Birmingham, and is published every month by Imperial Chemical Industries Limited, Imperial Chemical House, Millbank, London, S.W.1. Phone: VICTORIA 4444. The editor is glad to consider articles for publication, and payment will be made for those accepted.

## CONTENTS

The 'Dulux' Story, by D. C. Ellis . . . . .	398
One Man and His Job—Ballistics Expert . . . . .	404
Information Notes:	
Back to School at Forty, by David D. Ogilvie . . . . .	406
Films in Industry, by Gordon Begg . . . . .	408
Christmas Quiz, by P. C. Allen . . . . .	409
Garden Notes, by Philip Harvey . . . . .	410
The Care of Paintings . . . . .	412
News in Pictures . . . . .	420
People and Events . . . . .	424
City of David, by Clarence Loughnane . . . . .	428

FRONT COVER: *Winter Scene*, by Hendrik Avercamp (1585-1663). (By permission of the Trustees of the National Gallery)

## OUR CONTRIBUTORS



Donald Ellis, Trade and Retail Sales Manager of Paints Division, had a varied career before settling down in the paint trade—in the Merchant Navy, studying engineering at Loughborough College, as a china clay mining engineer, as an engineer with a petroleum company. In 1930 he became a paint salesman, and sold paint for twelve years before being appointed to his present job.



Clarence Loughnane works for a pharmaceuticals firm in India, which he joined after eight years with Pharmaceuticals Division as an overseas representative and with I.C.I. (Export) in Baghdad.

# The 'Dulux' Story

By D. C. Ellis (Paints Division)

'Dulux' has had a fantastic success since its introduction to the building trade 25 years ago. Foundation for this success is the simple fact that 'Dulux' is a better paint. But the job of putting 'Dulux' over and organising a steady flow of paint as and when the public wants it has called for imagination, calculated risk-taking and careful planning.

**D**ULUX was first sold to the building trade in Britain in 1932. In those days paint was not paint unless it was heavy-bodied and made from white lead, linseed oil and turpentine. The painters of those days were sceptical of the synthetic paint, of which 'Dulux' was the leading example. The very word "synthetic" they regarded as a dangerous and new-fangled idea.

Indeed, 'Dulux' was very different—it felt different under the brush, it was different in thickness, and it lasted much longer. It was suspiciously thin in the can and produced only a thin coat, and the directions for use contained this heresy: "Apply 'Dulux' gloss on gloss." It dried very quickly, and that fact was a real difficulty when large areas were involved—"joining up" needed much dexterity.

That 'Dulux' was durable to a degree then unknown was certain; but how could we convince the painter without years of exposure? We couldn't; so we relied on architects and other specifiers to compel decorators to use it, and that is how we forced our entry to the decorator market.

In 'Dulux,' synthetic resin of unvarying high quality displaced natural resins of erratic quality and, by synthesis, was "built into" the paint medium. This medium produces a paint that remains elastic for many years and practically never cracks or "crazes"—it wears away very, very slowly by minute "chalking" of the surface. Repainting an old 'Dulux' surface is a pleasure, for no scraping or burning off is needed unless moisture within the woodwork has loosened the paint. The medium is known generally as an "alkyd."

There were teething troubles, of course, especially in brushing and undue chalking, but these have long

been overcome. Even now we constantly seek, and sometimes find, ways of improving the near-perfect paint. Today practically all the best-known brands of building paints are made with alkyd resins, just as 'Dulux' was a quarter of a century ago. But we still have a long lead in know-how.

In 1932 we knew we had a winner, but the selling

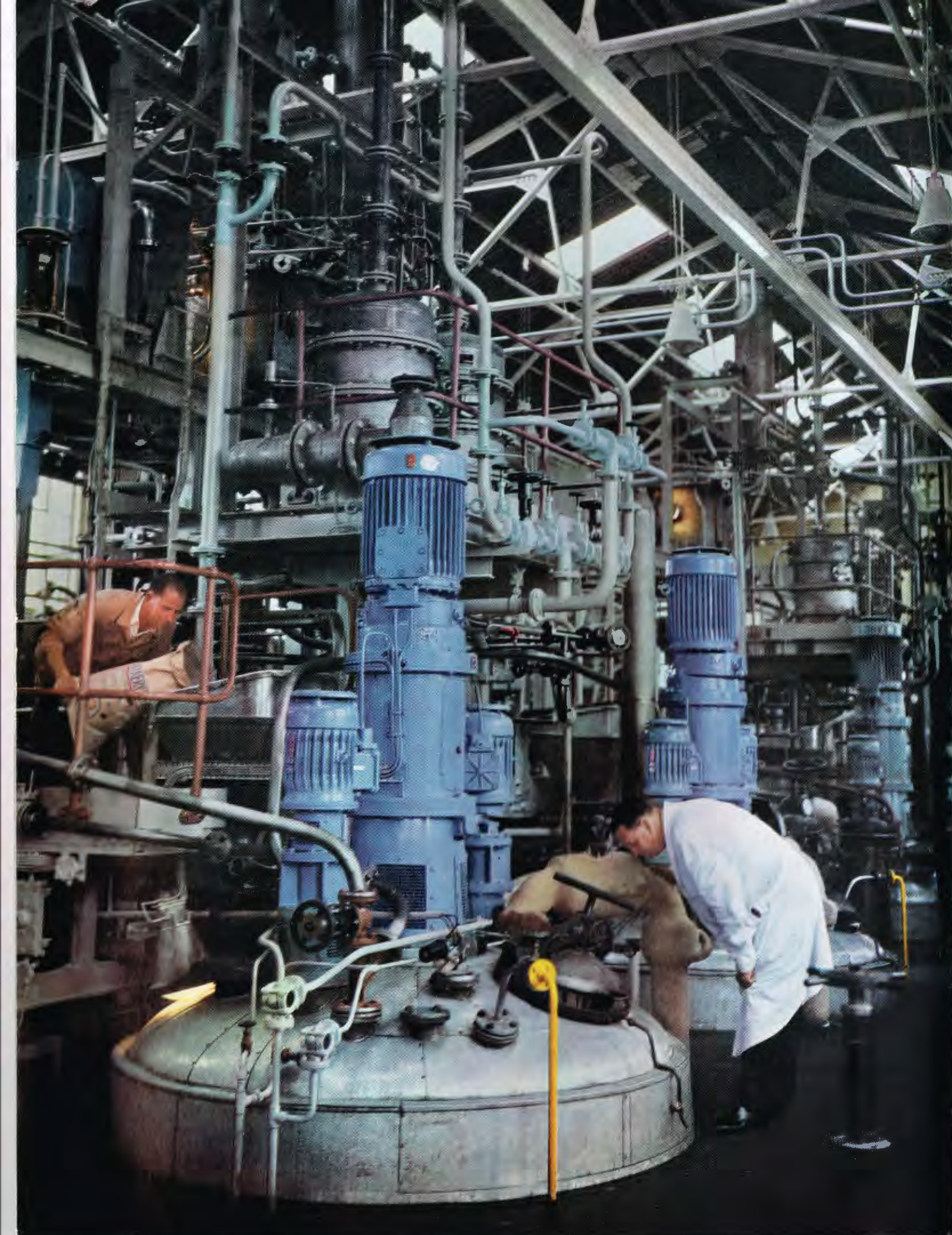
of it was a whale of a problem: we had no reputation and no channel of distribution. A handful of representatives set out to persuade painters to buy, architects to specify and merchants to stock a paint that was new and relatively high priced. True, it was far cheaper in terms of cost per yard or cost per year—but paint makers had told that tale over and over again and it had cut no ice. When war came in 1939 we had our foot in the door—about 28 merchants were stocking and helping to sell it, and many architects, public authorities and property owners had convinced themselves that 'Dulux' was welcome and a promising invention.

The war put a complete stop to 'Dulux' manufacture, and it was not until 1948 that the necessary raw materials could be had. But the ill wind of war did us some good. Schools, hospitals and houses painted with 'Dulux,' which had been neglected for six years or more, were in far better fettle than those painted with orthodox types—this was most notable on coastal exposure. This news quickly got about, and, as soon as we could make it again, 'Dulux' sold like



Plotting the progress of each batch on charts is the work of recording clerks on duty day and night. To this room comes the flow of orders which are then worked out in terms of manufacturing instructions to the factory.





(Left) Giant thermostatically heated "kettles" at Paints Division's Slough Works. In these kettles synthetic resin, the body of the modern paint, is brewed up. (Above) Pigment being tipped into a ball-mill below, where pigment and varnish are ground together by thousands of pebbles cascading as the mill rotates. (Below) 'Dulux' being strained through thick felt to ensure uniformity.







Speed and accuracy are essential in filling 'Dulux' into millions of cans of different sizes. Paints Division engineers have designed ingenious machines to do the job.

hot cakes. By 1952 it was the leading brand of paint in the professional field.

By this time things were changing rapidly in the paint trade: the cost of professional decoration was rising to prohibitive levels for the householder, who would be forced to do it himself. The writing was on the wall. There was no doubt that a vast market was opening up and that 'Dulux' was an ideal paint to meet the public demand.

Neither we nor our merchants knew much about the retail market. We canvassed merchants and decorators to test the prospects. Merchants' trade was largely in the professional market—some were willing to risk offending their customers, others were

nervous because there was a danger that to allow 'Dulux' into the hands of the public would offend professional decorators who had learned to regard it as a product for the craftsman. We decided that decorators who used 'Dulux' did so because they and their operatives liked it, and time has proved this to be true.

Despite these hazards we decided to take the plunge and put 'Dulux' on the retail market, and nearly all our merchants played their part by stocking small sizes and delivering them to retailers.

Today practically no merchants shut themselves off from the retailer, and most of them have their own retail counters doing a brisk trade with the public.

More and more decorators have opened their own retail shops, and their trade journals devote space to the problem of selling to the householder. Scarcely a town is without its paint and wallpaper shops; hardware shops stock paint in abundance, and departmental stores set aside much floor space to Do It Yourself.

So every door to the amateur is open, and paint—especially 'Dulux'—is flowing through. 'Dulux' sales have risen to a significant extent by a snowball effect: Dick copies Tom, and Harry asks what paint they used.

### Just in Time

By making a start in 1953 we were only just in time to catch the tide in the retail market. Had we waited, the advertising and promotional costs would have been very high indeed and the prospect even less predictable than it was.

This story shows that we chose to reach the shops through our builders' and decorators' merchants rather than make the direct approach to the retailer. It is a choice we have never regretted—our merchants have extended their premises, shelving, counters, transport and staffs, with welcome and lasting benefit to themselves and us. Over 90% of our trade and retail sales pass through our merchants. We suffer much embarrassment vis-à-vis our merchants: they are so zealous that we have to regulate the number, quality and location of the retailers they serve; if we did not, 'Dulux' would be on show in most unsuitable places.

### Customer Satisfaction

To succeed, the quality and characteristics of our paints must match what the customer wants. Happily, the qualities which were built into 'Dulux' for the decorators are no different from those the amateur looks for. Everyone who paints wants the job made easy, its appearance attractive and its life assured for years; all this he gets from 'Dulux'—and more, because when he eventually wants to smarten his house or change the colour scheme, scarcely any preparation is needed before painting again. Perhaps the strongest appeal to anyone using 'Dulux' for the first time is the extraordinary ease with which it can be applied and the rapid disappearance of brush marks.

When we decided to have a go at the retail market with 'Dulux' we knew that even with its quality and its reputation in the trade we would get nowhere

without advertising. We had to make a quick and shrewd assessment of how much to spend and in which directions and, most difficult of all, we had to estimate how much we would sell in the first year. The problem was full of imponderables and we were tyros in the retail publicity field—I.C.I. had never before sold its products to the public in such a big way.

### Modest Beginnings

We began modestly with black and white pictures and announcements in the press—magazines, the *Radio Times* and the more staid Sunday papers, and with display material for the shops—hanging signs, pelmets and large colour charts. To this we added liberal supplies of colour cards and leaflets. The result was most gratifying. By degrees we moved to full pages in colour and more of them, to posters on buses and railway stations; to more-elaborate show-pieces; most attractive colour cards in abundance; better and more instructive literature; and professional window dressing. We have just inaugurated a van service to assist the retailer to maintain his display material. Two years ago we were one of the first paint firms to advertise on television, and we have every reason to believe it an excellent investment.

One can never be quite sure which of the many forms of publicity is the most effective.

The keynote of our advertising has been, and still is, first-class artwork well displayed to make a heavy impact, and nearly always an absence of blurb. We believe that the I.C.I. roundel has a big pull and is worth far more than copy which can say little that has not been said hundreds of times by other advertisers.

### Stocking and Delivery

Our sales promotion is strengthened by technical and colour service, but these valuable aids are applied mainly to the professional market. Behind it all is a very keen team of sales representatives who keep in constant liaison with merchants and retailers.

Where does all this paint come from? Where is it stocked, and how is it delivered? Paints Division, until after the war, was concerned mainly with motor manufacturers and industrial paint markets, and packed its products very largely in five, ten and forty gallon drums, and even delivered by road and rail tankers. The advent of 'Dulux' to the decorative market increased the demand for gallon, half-gallon

(Continued on page 427)



# Ballistics Expert

THE notice on the heavy wooden door was imperative. "When passing this point take the key with you." Watching my guide slip the large tubular brass key into his pocket, I followed him over the threshold. There I saw the reason for these precautions. Two fixed rifle barrels held us in an unwavering gaze. We were at the target end of one of the firing ranges in the gun room at Ardeer Factory.

I turned to my guide, but he was walking towards the armour-plate targets with the easy stride of one who is quite at home in his surroundings. Naturally, for in the gun room Robert Havlin is on very familiar ground. He has worked there for some 28 years, building up his knowledge of guns and ammunition. He is, in fact, an expert: his subject, ballistics.

What are ballistics? Robert Havlin explained: "Velocity and pressure—the velocity of a bullet over a measured distance, the pressure set up in the barrel chamber of the weapon that fires it."

Ballistics statistics are vital. They enable the factory's Propulsive Department to check the composition of every batch of powder they produce. Propellents Research, too, can put experimental samples on trial, and the burden of proof is on the gun room.

"Here's where we start," said Robert Havlin, drawing me over to a lab balance in front of a sunlit window. "This is automatic—battery operated. We use it for weighing off test charges for shotgun cartridges."

I watched as a steady flow of powder from a 4 oz. sample bottle was agitated into a cartridge case and listened as Robert Havlin explained the simplicity of the balance.

"It works on the doorbell principle. Whenever the correct charge is weighed off, it cuts out," he said.

No less deftly he completed the remaining operations of cartridge filling—inserting the wads; weighing out and filling of shot; and crimping the ends of the case. Then came the checking of the test equipment.

"We never start a proof before checking the range conditions. A worn gun barrel, even a piece of grit on the target mechanism, can distort the ballistics," Havlin explained.

As he talked, Havlin's practised hands were busy setting up the equipment. Everything was ready—the appropriate barrel in position on the universal housing, the lanyard adjusted for remote-control firing. A final touch was to stretch a piece of copper wire across the muzzle.

"This is how we measure velocity. The exploding cartridge breaks the wire and sets the electronic timer counting in milliseconds. The impact on the target stops it again. From the reading we get the velocity."

Pressure is determined by slipping a small cylinder of copper—lead for a shotgun—slightly bigger than a cough-drop into the breech block. Fined down by the pressure of the discharge, the "crusher" is measured by micrometer and the reading converted into pounds per square inch.

The testing procedure is standard. All ammunition from the .22 sporting cartridge to the 30 mm. aircraft cannon shell follows the same process. And every powder is put to proof three times before it leaves the factory, for, as Robert Havlin explains, "what we are trying to do is to satisfy ourselves that it has reached the required standard." All the weight of his long experience is there to help make sure it does.

W.J.C.B.

Robert Havlin





## BACK TO SCHOOL AT FORTY

By David D. Ogilvie

*Back to school at 40 to the Harvard School of Business Management go senior American business executives, civil servants and army officers for a three months' course. Also invited are a few selected foreign businessmen, and David Ogilvie of I.C.I. (New York) Ltd. was lucky enough to be one of these.*

THERE'S an old saying in America that you can always tell a Harvard man but you can't tell him much. Well, I'm a Harvard man. I became one when I graduated last year from the Harvard School of Business Administration, and on reflection it seems hardly surprising to me that at graduation I should have felt that I had little left to learn. So intensive was the course—packed into thirteen hectic weeks—that anyone who managed like myself to survive the mere physical stresses and strains of American college life and to keep awake during a sizeable portion of the classroom time was bound to come away almost satiated with knowledge. But let me tell you something about Harvard and what happens when you go back to school.

Harvard University lies on both sides of the Charles River at Cambridge, Massachusetts. The Harvard Graduate School of Business was established in 1908 to train qualified men for positions of responsibility. Small at first, it has expanded rapidly of recent years and is now an important part of the University. Its main offering is a two-year course of study for university graduates leading to the degree of Master of Business Administration.

The Advanced Management Programme was organised in 1943 as a war production training course, and has been conducted in spring and autumn ever since. Some 3000 men have now graduated from it. Originally intended for the training of production people, it has been extended to meet the requirements of individuals from all walks of business life, including government leaders and officers from each of the military services.

An average A.M.P. class comprises about 160 men, aged generally about 45 but ranging from somewhere in the mid-30's to the mid-50's. The average length of business experience of a student is 15–20 years. A typical class has about 145 businessmen, 10 military officers and 5 civil servants. About 10 of the businessmen are generally people from abroad. Functionally, about 40 of the men are in marketing, 30 in administration, 30 in production and manufacturing, 15 in accounting and 10 in finance. The class of which I was a member, the 29th of the series, numbered 163 but through illness was reduced to 158 by the end of the course.

We assembled on 22nd February, a cold wintry day, and immediately set about fitting ourselves into a strange and somewhat disquieting environment. First we were each assigned a room-mate, a man with whom the next thirteen weeks were to be spent in somewhat intimate contact. Mine was sales manager of a large paper company in San Francisco—fortunately a most sympathetic individual and now I am glad to say a close personal friend. Then we were organised into groups of eight, so-called “can” groups, because each group occupied four bedrooms, two on each side of the toilet facilities. Finally we were assigned to two groups of approximately 80 men. These were separate classes for lecture purposes.

The method of study was by the Harvard “case” system. The cases presented covered Business Policy, Administrative Practices, Cost and Financial Administration, Marketing, Labour Relations, and Business Ethics. In addition there were special lectures to be attended, afternoon seminars on salesmanship, the organisation of industrial research and related topics, “bull” sessions at which students introduced any topics they wished for general discussion, and evening periods devoted to public speaking and business communication.

The cases presented were concerned with problems and situations which had actually occurred in business. They were drawn from the whole range of industrial enterprises, from great corporations such as Ford, U.S. Steel and Standard Oil of New Jersey to small family businesses. Each case was first read and discussed with one's room-mate. Then it was dealt with in more detail at a “can” group meeting and on the following day was debated in class. Three or four cases were studied each day, necessitating the reading of some 30,000 words and attendance at class sessions, which lasted from 8.45 a.m. to 12.45 p.m.

The role of the professor in class was simply that of moderator of discussion. Only at the beginning and end of the various courses was there anything approaching the conventional type of lecture. Individual students expressed views based on their own experience or on the methods employed in their own companies.

Sometimes there was general agreement as to the action demanded by the circumstances. More often there was

controversy, sometimes even heated disagreement. Seldom or never even in the most contentious cases did the professors offer solutions to the problems. At most they would indicate that the company in question had prospered despite its apparent deficiencies or that it had “folded” and gone out of business. At first this seemingly offhand treatment was difficult to understand until it was realised that most of the problems were capable of several solutions, as, of course, are the problems of everyday business.

As the course progressed, it became noticeable that many of those who contributed most readily to the discussions at the beginning usually by quick and somewhat dogmatic solutions spoke less frequently and became more guarded in their approach. The classes as a whole, however, rapidly improved in general ability to grasp the essential points of a complex situation and to offer solutions other than the “firing” of all senior officials.

Most of the treatment of case material was at a good level and well illustrated the efficiency and skill attained by higher executives in American business. In dealing with “the law of the situation,” the utilisation of propaganda and advertisement in creating demand, market research, corporate finance and the niceties of different types of costing systems, they seemed to me to show considerable clarity of thought and maturity of judgment. But they were obviously much less happy when it came to topics such as international business relationships and the responsibilities of the American businessmen to the community and the world. Apart from unanimous agreement that Sir Winston Churchill was the world's greatest man and that American business was a potent force for the good of mankind, they had for the most part little conception of how America should exercise leadership of the free world. Indeed, many displayed a surprising lack of knowledge of world problems and even world geography and were frankly isolationist in their approach.

Socially, as one would expect, the course was a great success. Americans en masse are always most affable, and no one was allowed to stand apart from the general fun and games which went on nightly after classes and study were done. Some of the jollifications were expertly organised.

A high official of one of the explosives companies had a supply of firecrackers of mammoth proportions which he used to set off in metal dustbins during the early hours of the morning, much to the consternation of the dormitory inhabitants. The managing director of a steel company arranged, by a masterpiece of strategy and the passage of a certain amount of cash, to have all the fire alarms sounded



*A view of Harvard University, Massachusetts*

at 4.30 one morning when there was no less than two feet of snow on the ground and some 30 degrees of frost. This caused considerable confusion and a varied display of nightwear that had to be seen to be believed. Other entertainments were arranged on the spur of the moment—such as a party which went on all night to celebrate the promotion of one classmate to the rank of General in the U.S. Army (the general was put to bed with full military honours) and the forcible administration of sleeping tablets at 5 a.m. to another who always retired early because he felt it essential to have a good night's sleep.

All in all, however, the course was a full and rewarding experience. To enumerate all the benefits or even all the shortcomings would be well-nigh impossible.

One thing I did learn, and I think everyone there learned—greater respect for the other man; and, for the foreign observer, greater respect for the American business executive. He is in many ways a strange person. He plays hard and he works hard. Introspective, centred on the creation of wealth as his first and sometimes only goal, blunt and outspoken in approach yet open-handed and often soft-hearted, he has the energy, the enthusiasm and the skill to carry his country onwards to even greater material success than it has yet enjoyed.



# FILMS IN INDUSTRY

By Gordon Begg (I.C.I. Films Officer)

*Today most large firms find it worth their while to spend quite large sums of money on making films. I.C.I.'s Films Officer here explains why this should be so.*

THERE is nothing new in the fact that industry finds films a useful method of communication. I.C.I. has produced and used films since 1927. What is less well known is the extent to which all branches of industry are in fact using films today and the big sums of money which are being spent in their production. For the purposes of this note I am ignoring the direct sales-aid film. This type, which is produced in great quantities for the cinemas and television by advertising agencies and which varies in length from fifteen seconds to two minutes, I regard as straightforward advertising. The films with which this note is concerned are best grouped under their uses:

For use externally:	For use internally:
Indirect sales	Record and measurement
Prestige	Teaching and instruction
Recruiting	Information

This list is my own and, like most attempts to subdivide subjects, is open to criticism. Nevertheless

nearly all I.C.I. films fall readily into one of these seven categories.

Within an organisation like I.C.I. ciné cameras are busy exposing thousands of feet of negative every year. In Research and Work Study Departments and elsewhere the cameras record and measure, often using special techniques like high-speed and stop-frame, micro and X-ray cinematography. In some Divisions locally made films are produced, sometimes under the direction of Labour Departments. These vary from straightforward reporting of local events to ambitious scripted films. And from the I.C.I. Film Unit a steady flow of films of all types has come for more than a dozen years.

The number of firms like I.C.I. and Shell who support their own film units are few, and most of industry's films are produced by any of the hundred or so short-film production companies in Great Britain. Their output is surprisingly high. One of these companies, admittedly the biggest, produced 61 films for industry between January 1955 and April 1956. These varied in length and what is termed "production value" enormously, and therefore also in price, but it is a fair assumption that their combined cost was in the region of £300,000. Of these 61 productions 24 were in colour, and their average length was 21 minutes. Over half the total were either prestige films or for training or instruction.

And what of I.C.I.'s film production in recent years? Since March 1955 28 films have been produced, 24 of which were made by the I.C.I. Film Unit. They again have varied enormously, from the ambitious *Point of New Departure*, 35 minutes long, in Eastman Colour, and two years in the making, to the six-minute first aid film, *Examination of an Unconscious Patient*, which was shot in an afternoon. Internal Relations Officers,

doctors, sales managers, Civil Defence instructors, Technical Service managers—all these and others have come to us with something they wish to communicate. Part of our job is to advise these sponsors. Is a film the best method? If so, what will it cost? Important are the early stages in such projects, for it may well be that the subject-matter will not make a good film or that some other medium can do the job better or more economically.

Important, too, is to remember that the film's success or non-success cannot be judged by its reception at its première. Only after months, or even years, of distribution by the I.C.I. Film Library and careful study of the questionnaires which go out with each print can we safely say that a film has or has not been of value to the Company. Evidence shows that most of our films are in brisk demand. The Library has well over a hundred different titles in its catalogue, with a total of about 2400 prints.

In each autumn/winter month 1500–2000 loans are made. Who are these audiences? Some are sections of the public, at whom I.C.I. deliberately aims films. Doctors, dentists, farmers, veterinary surgeons and schoolteachers—these are some of our borrowers with special interests. Our films for schools, which have been very popular for years, are being augmented by a new programme of teaching aids, which is the I.C.I. Film Unit's main task at present. In this we are being helped by a panel of science masters. Other films go to borrowers from the general public who are merely interested in the Company and its activities and want to find out more about them. Anyone with a 16 mm. sound projector may borrow our films free of charge, and we are sometimes astonished at the number of people who ask for films on quite abstruse subjects. All in all, films in industry pay off and the making of them is on the increase.



By P. C. Allen

## OLD SONGS

1. Why wouldn't I give you 2d. for your old watch chain?
2. Why was I sitting all day in the Y.M.C.A.?
3. What did my old man bid me not do?
4. With what did a ride in a taximeter car compare favourably?
5. What do we proceed to do after "rising early in the morning"?

## SPORT

1. Of whom was it said that "he did not seem to follow the ball, the ball seemed to follow him," and by whom?
2. Who was "so terribly afflicted with the gout that a great arm-chair was brought into the field," so that "after the delivery of the ball, the hero sat down in his own calm and simple grandeur and repose"?
3. What great event happened on Lindrick Heath on 5th October 1957?
4. Whose record failed to be matched in the last Cup Final?
5. Who were Michel Croz and the Taugwalders?

## GENERAL

1. Whose housekeepers were: (a) Mrs. Hudson, (b) Mrs. Pearce, (c) Mrs. Anna Williams?
2. Who said "Britain is the birthplace of my fame"?
3. Who said "Don't cheer me, my men, you did it all yourselves"?
4. Who is An Taoiseach?

5. Who was "the German who composed Italian music to please the English people"?
6. Where does Gasworks come before Copenhagen?
7. Distinguish between A.B.C.M. and I.C.B.M.
8. Name three garments derived from the Crimean War.
9. Who prowled around whose studio muttering "The dead paint the dead"?
10. Who invented the Circumlocution Office?

## QUOTATIONS

Who wrote or said:

1. "The Greeks were inattentive either to the use or the abuse of chemistry."
2. "If silicon had been a gas I would have been a Major-General."
3. "I am just going to pray for you at St. Paul's but with no very lively hope of success."
4. "If pressed for time omit Cambridge."
5. "Why such impress of shipwrights, whose sore task does not divide the Sunday from the week"?

## GEOGRAPHY, TOPOGRAPHY AND TRAVEL

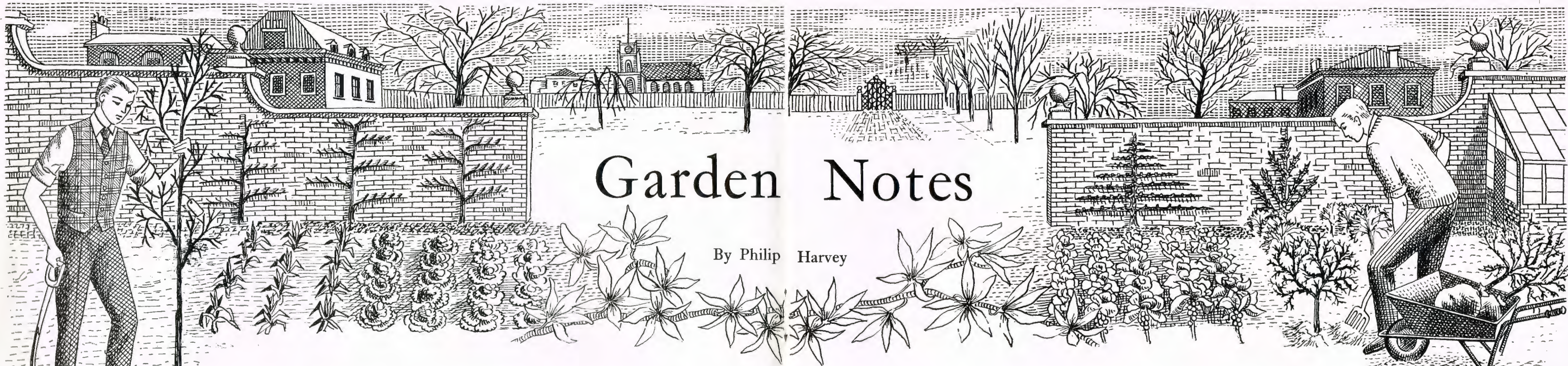
1. Where is the Maddermarket theatre?—and the Players' Theatre?
2. Where is Warrior Square Station?—and Moses Gate?
3. Where is Jack Straw's Castle?—and the Book Cadillac Hotel?
4. Where is Poultry?—and the Headrow?
5. Where is St. Nicholas Cole Abbey?—and Ste. Gudule?

Answers on page 427



I.C.I. Film Unit in action. Left to right: Sound recordist, continuity girl, focus-puller, electrician, assistant cameraman, lighting cameraman, director, clapper boy and boom operator.





# Garden Notes

By Philip Harvey

**Y**OU are unlikely to find boiled gooseberry pudding on the menu of any expensive restaurant. It is, however, a singularly delectable dish which is, I am told, appreciated and even enjoyed by food snobs. I am in full agreement with the gourmets, but am still sufficiently heretical to state quite categorically that as a dessert fruit eaten on its own, the gooseberry leaves me unmoved. Gooseberry Fool is another matter, although the sugar and the whipped cream really make this dish. Three or four bushes will therefore meet my needs.

When I came to my present garden part of the ground where I intended to plant roses contained some gooseberry bushes, obviously long past their prime. They were promptly dug up and a fresh planting was made elsewhere on a heavy, greasy plot where drainage was by no means ideal. In theory this was all wrong, as like most soft fruits, gooseberries are said to require perfect drainage. It was also wrong in practice, as this new planting has never looked happy. So far I have lacked the courage to dig up the bushes (they have only been in for three years) and transfer to a well-drained piece of land. Incidentally, my excuse for planting in poorly drained land was a liking to break the rules from time to time to see what really happens.

**T**he best soil for gooseberries is undoubtedly deep, well-drained land with plenty of organic matter. They will, of course, grow and fruit after a fashion on almost any soil, provided it is not deficient in potash. Shortage of potash is denoted by

leaf scorch, mediocre growth and a poor crop of berries. Work in generous supplies of wood or bonfire ashes or, better still, sulphate of potash before planting, especially on light, sandy ground where potash deficiency is usually more marked. Plant not less than 4½ ft. apart, covering the topmost roots with 2-3 in. of soil.

Newly planted bushes are pruned fairly hard in February, the main shoots being cut back by about two-thirds. Pruning difficulties usually arise with established gooseberries, which are sometimes a tangle of prickly, unmanageable growths as the result of several years' neglect. Begin by removing all dead wood, and where two branches cross, cut out one of them. The main shoots are then tipped or cut back fairly severely if the bushes are, say, four or five years old. If the centre of the bush is too crowded, remove one or more of the main shoots. New growths will eventually take their place. It is also advisable to cut back the laterals or side growths to about 3 in. to encourage fruiting spurs. Laterals may also be summer pruned in late June or early July to four or five leaves.

**T**he general aim in pruning gooseberries is to keep the centre of the bush fairly open, to permit free circulation of air, to let in sunlight and to make picking easier. Bad air circulation encourages attacks of American gooseberry mildew, a disease which seems less troublesome nowadays, although it can be a nuisance on bushes which have been over-manured, a state of affairs which seems unlikely at the moment with the high price and relative scarcity of farmyard manure,

especially in or near large towns. Any mildewed shoots should be cut out and burnt directly they are noticed. Old wood is not usually infected, the mildew over-wintering on the tips of the new shoots. 'Spersul' is effective against this disease.

When it comes to varieties, I can only say that whatever catalogues may tell you, the same kinds can nearly always be used for both dessert and culinary purposes. To me gooseberry varieties are all much of a muchness, but those with more discerning palates or perhaps greater powers of self-persuasion, insist that the yellow and small, dark green varieties are the sweetest, the large kinds like Careless and Leveller being brisker and more refreshing. Among the new varieties Green Gem is especially commendable. It seems resistant to American gooseberry mildew.

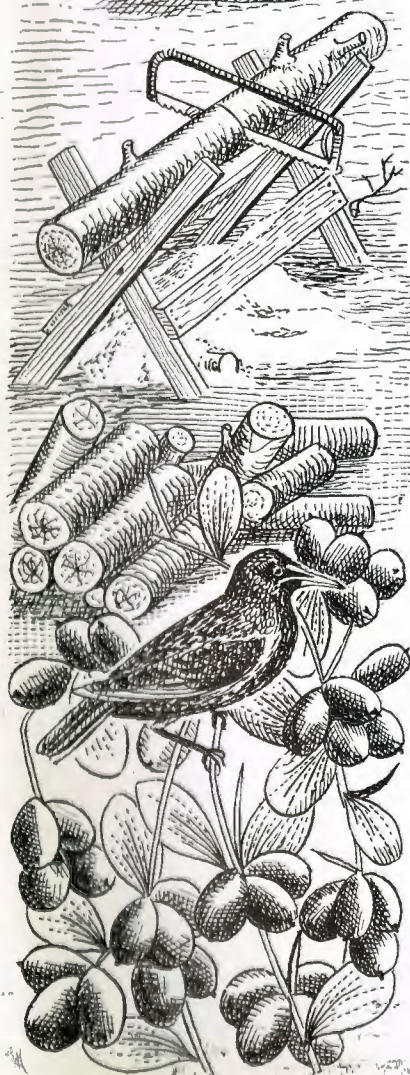
**D**uring the last six or seven years there has been a tendency to prune rose trees in winter rather than early spring. Is December pruning really preferable to cutting back at the traditional time? There is no cast iron answer. It is claimed that roses pruned when the trees have completely finished blooming and are practically leafless, i.e. during December or January, never bleed, start into growth earlier, produce their first crop a week or two before those pruned in March, and are not susceptible to injury by late spring frosts.

Those who argue on these lines usually base their experience on pruning during a mild winter such as last year's. Admittedly May frosts do appear to cause less dieback on winter-pruned roses than on those pruned in

spring, but cutting back in winter stimulates premature growth, and if a really cold spell follows soon afterwards the trees will receive a definite check and there is then no advantage in respect of time over March pruning. Even if one admits that winter pruning yields as good results in the long run I doubt very much if it produces more vigorous or more productive trees than those cut back at the traditional time.

**A**ll this refers to pruning proper, i.e. cutting back healthy, well-ripened shoots. You can and should remove diseased wood at any time of the year, similarly all soft, sappy shoots which have failed to ripen and will probably succumb to frost, cold winds or drought. Extra long shoots which are liable to sway in the wind can also be tipped in winter.

Why do so many gardeners overlook the so-called Christmas Rose? *Helleborus niger* bears pure white, single flowers at intervals from December to March. The blooms can be protected with a cloche in bad weather, or the buds may be picked and opened indoors. Experts always maintain that this plant prefers a moist, rich loam and partial shade. However, the best specimens I have ever seen were alongside a fence in a fairly sunny position, and in a Cambridge garden where they grew like weeds, although Cambridge is considered one of the driest areas in the country. The best time for planting is in early April, and I would advise working in plenty of compost, peat and leaf mould as well as a slightly shaded aspect, since the above is the exception that proves the rule.





# The Care of Paintings

(Contributed by the National Gallery)

**In the care of paintings science and art go hand in hand. They play complementary roles; and the role of science owes much to the late Sir Wallace Akers, former I.C.I. Research Director, for seven years a member of the National Gallery Scientific Advisory Committee and for five years a National Gallery Trustee.**

**W**HEN was your house last repainted? However smart it may be now, dilapidated paintwork is the most constant reminder of the impermanence of things, the first sign of old age in our possessions.

And yet a walk round some of the world's galleries of paintings shows that the changes of time can be almost prevented. Pictures more than 500 years old hang today as if fresh from the artist's studio. How is this done? And what problems have to be faced?

Look first at the variety of materials artists have used. Two centuries of chemistry are still no match for 20,000 years of experience in the choice of artists' materials. Mineral pigments, mined from the upper strata of the earth's crust, where they may have lain for millions of years, could scarcely undergo much further change embedded in an oil or tempera film. Vegetable drying oils, such as linseed oil, after some rapid initial changes on drying soon become extraordinarily inert and tough. Egg was used even before oils as a medium for carrying pigments, for it does not go bad if laid out in a film so that its moisture can quickly evaporate. In fact the protein of which it is half composed is, by recent indications, incredibly permanent. Deposits of protein in rocks over 25 million years old have been recognised by their constituent amino-acids.

Other natural media are animal glue, starch and casein (the by-products of cooking bones, cereals and milk respectively); beeswax; and gums and resins.

## *Problems from the Past*

All these materials have probably been used for painting from the very earliest times. Unfortunately they are not all easily distinguished by chemical means. Up to now the issue of identification of materials has frequently been evaded when examining very

old paintings by simply calling the medium "tempera" if it is not shiny or waxy. This ill-defined expression means different things in different places. The word should always be prefixed by the kind of tempera (if known!): egg-tempera, glue-tempera or whatever it is.

Chromatography is the obvious method for settling this difficulty, and a scheme has been worked out here for applying it to the detection of small quantities of oils, and also of protein media such as glue and egg tempera. The way has now been almost cleared for the collection of data.

## *National Gallery Collection*

In the National Gallery collection the situation is fairly simple. All the paintings belong to the later ages of civilisation, and painters' methods can be studied from contemporary documents. Medieval and early Renaissance easel paintings were normally in egg tempera. Thereafter there was a transition at the time of the Van Eycks to the almost universal use of drying oils from the sixteenth century onwards. Practically the only paint media that remain in doubt belong to the Van Eyck period (fifteenth century).

The body of a good painting, then, consists with one or two notable exceptions of extremely permanent pigments embedded in a medium of long-proved durability. Why, then, are so many old paintings in a deplorable condition? The reason is twofold. A painting needs adequate support behind and protection in front. These are the functions, respectively, of the prepared panel or canvas, and of the varnish. Most of the damage suffered by pictures, apart from straightforward knocks, blows and gashes, are due to failure in the support, and many of the remainder to failure of the varnish.

Until about 1450 the support of paintings was almost always wood—in Italy generally poplar, in

Germany lime, pine and beech, and in the Netherlands oak. Then, fortunately for conservators, the advantages of canvas began to be realised, so that by 1500 the North Italian painters in Venice, and Florentines such as Botticelli, were painting large pictures on canvas. The change coincided with the increasing proportion of secular as against religious paintings. The latter, regarded as permanent items of church furniture, still tended to be painted on wooden panels.

## *Repair of Panels*

The treatment of these panels presents serious difficulties. Usually they consist of a number of planks cemented together, often with casein glue. Sometimes they are well preserved; in other cases they are extensively worm-eaten, warped and cracked; and the warping and splitting are often increased by nineteenth-century attempts to cure it. Wood is subject to swelling and shrinking with variations in the relative humidity of the atmosphere. In the course of time permanent contraction of exposed surfaces takes place, so that the unprotected back of a picture shrinks relatively to the front. Thus each plank of a composite structure may acquire a convex warp, which cannot be removed without danger to the paint.

Various methods have been proposed and tried. One is to shave off a proportion of the most severely contracted wood and then to constrain the panel flat by heavy wooden battens glued across the grain of the wood. Another is to flatten the panel by inducing moisture and then maintain the flatness with presses while the excess moisture dries out; the convexity then only partially returns, probably because minute ruptures have been created in the wood structure.

## *Legacy of Damage*

Cross-battening is still practised in some studios, though it has left a dreadful legacy of damage for modern conservators to deal with. Changes in atmospheric humidity, and especially the prolonged dry spells which occur in England round about March and April, produce further contractions and expansions. If the pictures are held flat by cross-battening, enormous strains are set up which are sometimes relieved by the entire picture cracking across, and, of course, shedding paint along the line of the crack.

In the severe winter of 1946-47, during a long frost a National Gallery Rubens panel cracked in half in the middle of the night, startling the nightwatchman with a noise like a pistol shot. Then there is the case

of a famous picture by Piero della Francesca painted on poplar which had come apart at the joints in the nineteenth century and was repaired in the 1890s with a system of longitudinal and transverse battens known as cradling. A photograph was taken at that time. In 1949, it was found, by comparing the picture with the old photograph, that the most serious of the present cracks had occurred since the previous treatment and were at the edges of the battens.

Our treatment of this picture consisted in shaving the wood down to wafer thickness and building up the back with balsa wood (whose thin cell walls give the least amount of dimensional response to humidity changes). A moisture-resistant adhesive of wax and resin was used, and the structure was strengthened with a heat treated aluminium-magnesium-silicon alloy.

## *Dramatic Moment*

A more drastic treatment, which has been used at the National Gallery, consists in removing the wood altogether by patient and protracted work with planes and gouges. A dramatic moment in the treatment is reached when the picture is seen in reverse, often with the last details and afterthoughts of the artist hidden on the other side of the main paint layers. A new ground and support (usually of balsa wood or synthetic medium hardboard) has then to be built up. This is a major operation and is only carried out when the patient will otherwise die altogether!

Such methods of "transfer," as it is called, have been used for many years, and have been progressively improved. They were probably invented in France during the Napoleonic era, when there was a considerable movement of pictures around Europe.

Treatment of pictures on canvas is child's play compared with that of wood-panel paintings. The canvas deteriorates with time and is reinforced by sticking another canvas to the back, nowadays usually with an adhesive of wax and resin, which has the advantage of partially insulating the structure from atmospheric moisture. At the National Gallery we are toying with the possibility of using a modern synthetic fibre such as nylon or "Terylene."

Varnishes have been one of our particular concerns. If a material is sensitive to oxidation, as all organic materials are to some extent, and if the process is promoted by light, a very good way of speeding the reaction, as chemists well know, is to lay the material out as a thin film. This is unfortunately just what the painter has to do, and while it serves very well for the



TITIAN (1480? — 1576)

VIRGIN AND CHILD WITH  
ST. CATHERINE AND ST. JOHN

(39½" x 55½") — *National Gallery, London*

Titian, born at Pieve di Cadore in the Venetian Alps, belongs to the Venetian School of painters. His "Madonna and Child" here reproduced, said to be painted c. 1530 — a letter of that date mentions a picture believed to be it — was for many years in the Sacristy of the Escorial, Madrid. In 1860 it was bought in Paris and brought to London. The cleaning of this magnificent painting in 1956 revealed the vivid richness of its colours which are natural mineral or earth pigments ground by hand and mixed with oil.







**BEFORE CLEANING**  
(Except for small patches where cleaning has just begun).

ADORATION OF THE SHEPHERDS (89½" x 64½") Painted about 1620-1630 and first thought to be an early Velazquez, then attributed to his contemporary, Zurbaran, but authorship and country of origin still remain uncertain. The original, now in The National Gallery was bought in 1853 at a sale of pictures from the collection of King Louis-Philippe of France.



ADORATION OF THE SHEPHERDS—1957 The same picture after cleaning.



initial drying of the film, it inevitably shortens its life.

We must imagine that, quite apart from abrasion, some very gradual chemical attrition is constantly going on at the surface of a picture. It is one of the purposes of a varnish to cover the paint surface and to bear the brunt of the attack on its own surface. The varnish is in this way considered to be an expendable and replaceable material. And since no one in his senses can at the moment foresee a perfectly inert, or "ideal," picture varnish, it follows that one of the most important properties of a varnish is that it should be replaceable without difficulty and with no damage to the picture.

A picture, then, needs a varnish for its protection. Equally the varnish is important for its appearance. The reason for this is not immediately apparent. The gloss associated with a good varnish is not its primary object, and is, indeed, almost incidental. A varnish is necessary to enable us to *see* a picture. If the pigment particles in the surface of an oil painting were the only important ones, or if there were only a single layer of pigment particles—as is approximately the case with a watercolour painting—then we would need no varnish. But a painting which makes full use of the oil medium is a painting in depth, where the total impression is made by several layers and colours of pigment particles in a transparent medium.

### *Need for Varnish*

When oil paint is first applied it appears glossy, and the pigment particles within it then give their deepest colour. This is how the artist sees his own picture. But the glossiest of films becomes more matt with time, and then light reflected diffusely at the surface interferes with the colours, lightening them and blurring differences. This is very much like rubbing the picture with sandpaper or putting a piece of frosted glass over it. The freshness of the colours can, however, be simply restored by coating the surface with a solution which dries to a glossy film—in fact, a varnish.

Although we have regarded varnishes as essentially replaceable, this should not imply that a varnish which must be frequently changed, as one changes the oil in one's car, is satisfactory. Unhappily the natural-resin varnishes, used universally until a short time ago, need changing far too often. Exactly how often depends greatly on circumstances: a figure of fifty years is often quoted.

What more natural, under the circumstances, than

that the new synthetic materials should be welcomed as varnishes? By the late 1930s many important pictures—not in this country—had been varnished with polyvinyl acetate (the binding medium of most of our commercial emulsion paints) and in the 1940s with polymethacrylates ('Perspex' is a polymethacrylate).

### *A Suspected Snag*

All went so well that we in this country were beginning to be regarded as rather backward for not using synthetic varnishes—until a certain suspected snag was confirmed. In the plastics research laboratories much effort has been expended on making soluble plastics insoluble. This is known as cross-linking, because the object to be achieved is literally a linking of the molecules one to another. Certain of the synthetic varnishes do just this, but of their own accord, slowly and imperceptibly over many years. In particular, this fatal defect has been shown in our laboratory to occur with some of the methacrylates. Indeed, after exposure to strong sunlight one set of samples of high-quality material became about as insoluble as old oil paint itself. It is difficult to see how such a varnish, if it later became opaque, coloured or cracked, could ever be removed without damage to the oil film.

The standard answer in such cases is to add a chemical to the plastic that absorbs dangerous radiation or prevents oxidation. But from our ultra-long-term point of view this is a misleading policy, for such chemicals sooner or later become exhausted or evaporate from the film, and after this the cross-linking or other deterioration is free to begin once again.

### *The Synthetic Resin*

Nevertheless the prospect for synthetics is not so black as might appear. Synthetic resins which are not in danger of cross-linking and which yellow less than the natural resins are being tested, and may soon be in use. In the future we hope to find better answers still.

The removal of old varnishes, generally of nineteenth-century origin—when it was the fashion to tint a varnish with brown dyes—is not the most important function of the conservator, but it is the most discussed and criticised. The need for it, curiously enough, seems to be more widely appreciated by the general public than by some art experts. The effect

of a brown and often semi-opaque filter is to alter and diminish the cool tones of a picture at the expense of the reds and yellows. Blues become greens, and both often appear as greys. Subtleties disappear, delicate flesh tints of creams and pinks become a coarse, hot yellow-orange, and detail becomes obscured.

The removal of this filter of old varnish varies in difficulty and is still a matter of experience in applying traditional empirical skills, helped nowadays by a larger range of organic solvents than hitherto. No great skill is required in removing a soft resin varnish from an old well-preserved paint film no longer soluble because of chemical changes wrought by time. The difficulties arise when a tough oil-resin varnish has to be removed from an oil-resin paint or when areas of an otherwise "easy" picture are more vulnerable than they should be, due to decay or to some mysterious manifestation of the pigment-medium relationship.

### *Artist and Scientist*

Although some of the masters of the Renaissance were scientists as well as artists, they were also idiosyncratic individuals. Each interpreted a broad general tradition of craftsmanship in his own way, and did his best with the materials of his time. The trained restorer, whose attitude of mind and training is perhaps closer to that of the original artists than is that of the art historian or the scientist, is constantly on the watch for the unexpected in technique, and can take appropriate action.

Many things can happen to the paint layers themselves, and it is rare indeed to find in perfect condition a picture painted before, say, the period of the French Impressionists. Sometimes the paint can fall off altogether in patches. There is the case of a picture by Delacroix in which, by a series of catastrophes including a flood, two-thirds of the paint surface was irretrievably lost. In the National Gallery a member of the conservation staff is permanently at work detecting and treating loose paint. An even more serious cause of damage, now happily rare, is the effect of crude attempts to clean the surface of the pictures. In the mid-nineteenth century (and sometimes still today) a picture was cleaned and restored every time it changed hands, so that it is not surprising that a certain amount of wear and tear takes place. If a small piece of paint is lost, an experienced restorer can repaint the area in the style of the original, generally by simple interpolation, without the need

for invention or falsification. But when the top surface of a painting has been removed, the subtlety of the original cannot be replaced.

### *Pigment Defects*

During the Renaissance, and in fact until modern pigment chemistry began with the discovery of prussian blue in the eighteenth century, the artist's palette, although basically sound, had one serious defect. This was a transparent green prepared by dissolving verdigris in an acid resin. Starting as a dazzling emerald colour, it changed within a century to a muddy dark brown. The effect can be seen by studying almost any Italian picture in the Florentine or the Venetian School. The lapis lazuli and copper carbonate blues retain their brilliance undiminished, whereas the greens of foliage and costume have changed irreversibly to dark brown. Other pigments, such as madders and yellow lakes, have sometimes become dimmer with time, and one has to accept with strong reservations the statement, often made, that when a picture is revealed by modern cleaning methods it is "just as it came out of the artist's studio."

In the eighteenth century a decline in painting technique set in with the widespread use of bitumen and with the unselective use of modern pigments and media. The restorer of nineteenth and twentieth century pictures will have (and already has) serious problems.

### *Present-day Indifference*

There are some exceptions, of course. Some of the late nineteenth-century Impressionist pictures are painted in an impeccably sound manner technically. The same cannot be said for the modern École de Paris, where many, perhaps most, of the painters are largely indifferent to the nature of the materials they use; and this is probably true in England also. The late Dame Ethel Walker said that she always rubbed her pictures with camphorated oil, because what was good for her chest must be good for her pictures!

The first principle of restoration is preservation. It is here that science not only can but must help. Basic research on the ageing of the artists' materials must be carried out. This is the purpose of the National Gallery laboratory. Only when results have started to come in from this long-term programme will science and conservation really have combined in the task of preserving the present and future acquisitions of civilisation.



# NEWS IN PICTURES



**Desert prospecting.** In the Libyan Desert several major companies are now prospecting for oil with the help of seismic explosives and detonators supplied by Nobel Division. One of the Division's technical service men, Mr. Gordon Teichmann, brought back this picture of four seismic shots going up



**Dreaming of a white Christmas.** The Christmas card for Leathercloth Division this year has been drawn by Mr. Jim Davies, a member of Hyde Factory's internal transport section. The drawing shows the Division's guest house, "Ferndale," in typical wintry conditions



**Old-timers at Elliott's.** Charlie Budd, Billie Mobbs and George Hodgetts recently achieved 50 years' service each at the Elliott Works of Metals Division. Mr. Hodgetts began his service at 13 with a young man who later became chairman of the Division, Sir Arthur Smout



**Life-saver.** The two emergency ambulances at Billingham Factory now carry a new type of compact, easily operated artificial respirator known as the Stephenson Minuteman Resuscitator. The machine, an American invention, automatically forces air into the lungs from a cylinder, then sucks it out



**Christmas sparkle.** A new sparkle is put into Christmas decorations by 'Melinex,' I.C.I.'s polyester film. In this window display by Harrods the tree is made from 'Melinex' metalised with aluminium by the vacuum process



**"Sunday Times" prize.** A Nobel Division research chemist, Mr. T. L. Cottrell, has been awarded first prize of £100 in a "Sunday Times" scientific essay competition. He is seen here receiving the award from Lord Weeks at the Royal Society of Arts

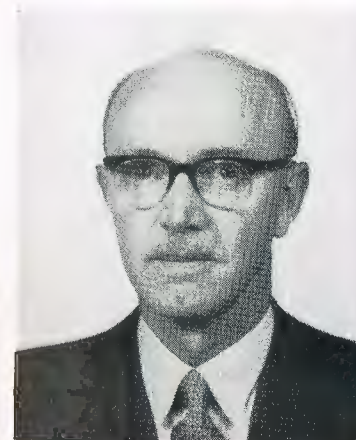


**Cyclone at Witton.** Engineering journalists were invited to Metals Division's Kynoch Works at Witton recently to see one of the cleanest and most efficient boilers in the country—a cyclone-fired boiler by Babcock and Wilcox. Shown above is the combustion chamber, where powdered coal burns as it meets a "cyclone" of hot air





**Dr. S. W. Saunders** was named last month as chairman of I.C.I.'s new Heavy Organic Chemicals Division. A graduate of University College, London, Dr. Saunders joined the Company as a chemist in 1926. He has been Technical Managing Director of Billingham Division since 1953



**Severnside Site.** Dr. H. S. Hirst (Billingham Division) has been appointed general manager of the Severnside Site. He succeeds Dr. H. G. Reid, who takes over as president of I.C.I. (New York) in January. Dr. Hirst was one of the team who planned Wilton Works and was works manager there from 1945 to 1947



**London Degree.** Dr. C. J. Stairmand of Billingham Engineering Research Dept. has been awarded the degree of Doctor of Science by London University for his work on atmospheric pollution and de-dusting problems. He joined I.C.I. in 1928 as a lab assistant and gained his B.Sc. degree in 1939 after studying at evening classes



**Canal Rescue.** The prompt action of a young lab assistant at Huddersfield Works, Malcolm Roche, saved the life of a 4-year-old boy who had fallen into the canal which runs alongside the works. Malcolm noticed the child from the laboratory window. He rushed outside, dived in and brought the child to safety



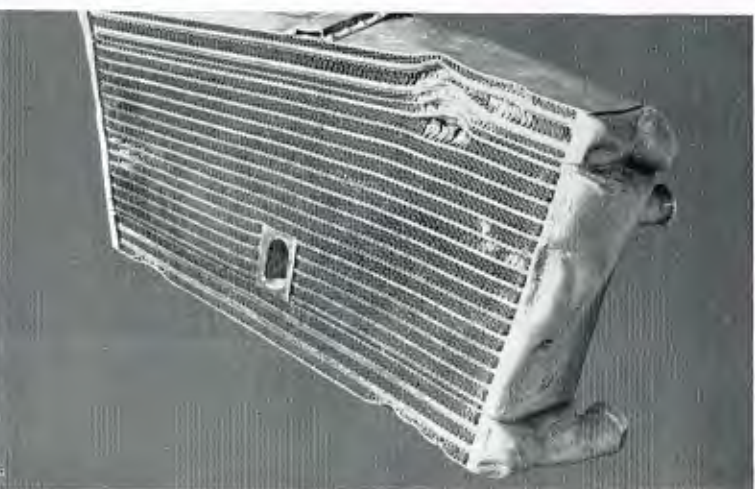
**At the Motor Show.** The I.C.I. stand at the International Motor Show at Earls Court in October featured the products of Paints and Leathercloth Divisions and Marston Excelsior. A highlight of the stand was a Marston light alloy radiator (above, right) removed from one of the Vanwalls which crashed in this year's Monaco Grand Prix. In spite of considerable damage to the connections, the radiator itself is still sound and free from leaks



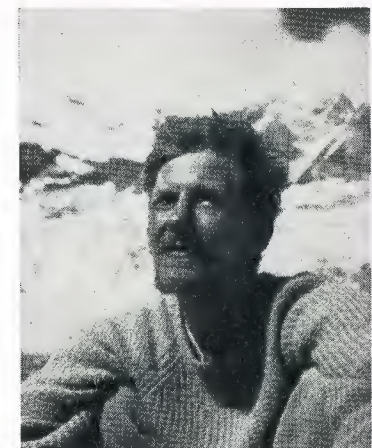
**Asian flu S.O.S.** A swift response by four week-end shift workers at Wilton to an S.O.S. from North Ormsby Hospital for ice for their oxygen tent helped to save the life of a young nurse seriously ill with flu. Six bucketloads of ice were chipped away from the Chlorine Plant and rushed to the hospital



**Tin can trophy.** The new trophy for the Paints Division interdepartmental golf competition, made by Mr. E. W. Blaber (Technical Services), is entirely composed of paint cans, lids and handles crowned by a golf ball



**Himalayan climber.** Mr. E. Dance (Dyestuffs Division) was a member of the Manchester Himalayan Expedition which returned home recently after an attempt to climb the unconquered 25,560ft. high Masherbrum peak. Their third and final attempt on the peak was abandoned only a few hundred feet from the summit



**Elizabethan laboratory.** This woodcut of a laboratory for testing metals, showing furnaces and distillation vessels, is one of the illustrations in Vol. III of I.C.I.'s "A History of Technology," which has just been published by the Clarendon Press. It covers the sixteenth and seventeenth centuries. The last two volumes will be published next year



# People and events . . .

**R**EGORGANISATION was in the news last month. Billingham Division is to be split into two, its organic chemical interests coming under the wing of a new Heavy Organic Chemicals Division. Four of the Metals Division factories are to be associated with the Yorkshire Copper Works Ltd. in a joint enterprise (see p. 426), and polythene production, research and development are to be transferred to Plastics Division, which has hitherto dealt only with polythene sales.

About 2500 Metals Division employees will be involved in the joint enterprise with the Yorkshire Copper Works, to which I.C.I. is contributing Kirkby copper tube factory, Allan Everitt copper and copper alloy tube works, the plate factory at Landore Works and the Fyffe fittings factory.

This will still leave Metals Division with some 16,000 employees and fourteen factories. Its interests range from copper, aluminium and titanium to 'Lightning' zip fasteners, porcelain insulators and printing.

★ ★ ★

"A man with muck on his boots is not really very interested in isomerisation." This was one of the more informal remarks made in one of the announcements of the decision to split Billingham Division into two.

Billingham began in the 1920s as a fertilizer factory, but for many years now the Division has been developing on a big scale its production of organic chemicals based largely on petroleum. The trend began in fact with the manufacture of petrol from coal in Oil Works in the 1930s. Since the war many other organic products have been developed by the Division and many large plants have been built to make them, including of course the

large cracker units in Olefine Works at Wilton.

This has become more and more a different field of specialisation from Billingham's traditional processes, hence the new Division. The fertilizer and other plants will still be called Billingham Division, but the production of organic chemicals in Oil Works and at Wilton in Olefine Works will be the responsibility of the new Heavy Organic Chemicals Division.

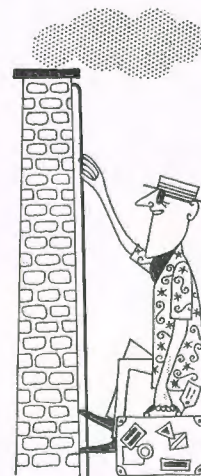
★ ★ ★

The personal links with Billingham will, of course, be strong. The chairman of the new Division will be DR. S. W. SAUNDERS, at present Managing Director (Technical) of Billingham Division, who has 30 years' service, all at Billingham except for a period when he was chairman of Lime Division. (Other members of new board, p. 427.)

## Holiday Article Competition

**M**R. H. MORRIS, a pump attendant at the Hillhouse Works of General Chemicals Division, wins first prize of £30 in the holiday article competition. The second prize, £20, goes to MR. G. A. TEICHMANN, who works in the Technical Service Department of Nobel Division in Glasgow.

Neither of the prizewinners went on a typical holiday—Mr. Morris went up a chimney, Mr. Teichmann went down to London—and so neither was tempted to try his



hand at descriptions of scenery and railway journeys, which are almost always boring. Both gave instead their very personal interpretations of quite homely places and events, and it is this personal approach that wins the reader's interest—and the prizes.

Mr. Morris is a Lancashire man born and bred, with what he calls in the Lancashire manner "a pon-ful of kids"—five of them, two girls and three boys.

Under the name of Pat Tippin he has written a number of articles in the Lancashire dialect for the Bolton *Journal and Guardian*.

Mr. Teichmann, as an expert on blasting, spends much of his time travelling, in this country and abroad. One technical service trip took him right round the world, but he complains that a large proportion of Nobel Division's explosives seem to be used in deserts and mangrove swamps.

## Skid-kid

**W**HILE the World Speedway Championship was being held at Wembley, more modest but equally exciting races were going on near Wormwood Scrubs. From them DEREK TEGG, a young laboratory assistant from the new Pharmaceuticals Division laboratories at Alderley Park, emerged as Britain's champion "skid-kid."

The skid-kids, more grandly called cycle speedway riders, race stripped-down bicycles on shale, cinders or plain earth. The sport has become so popular that it is now controlled by county control boards, which elect delegates to a national body. One well-known firm of tyre manufacturers has found it worth while to put a special skid-kid tyre on the market.

Derek Tegg reached the finals by winning the county championship of Lancashire during the summer. In the final he won his first three races in great style, but came equal third in the fourth race. This meant he had to win his last race to become champion, and although starting in third grid he made no mistake.

## Silent Salesmen

**I**.C.I., which spends about £12 million a year on new packages, is well aware of their value in sales promotion. At the beginning of this month an exhibition was mounted at Imperial Chemical House to show the standard of appearance of I.C.I. packages currently in use. The exhibits were drawn from all the Divisions and from Canada, South Africa, Australia and the U.S.A., with an occasional competitor's package to point a silent lesson. Later it is hoped that the exhibition will be seen in the Divisions.

As you might expect from a company that is one of the biggest makers and users of steel drums in Britain, drums are featured prominently. So are glass carboys (I.C.I. uses nearly half the country's production of these), paper sacks, and tins, and there is a



representative selection of the innumerable other packages that the Company uses, ranging from tiny glass ampoules to the largest pressure cylinders.

The exhibition drives home one lesson, at least, very sharply: that good appearance in commercial packaging is as important as in retail packaging. It is well known that people prefer to buy an attractively packaged product when they shop in the High Street. What has not been appreciated adequately, perhaps, is that bulk customers, buying detonators by the gross or soda by the ton, are also attracted by appearance.



## A MERRY CHRISTMAS TO ALL OUR READERS

### High-hat English

**M**R. E. J. TROTT of C.I.L.'s head Office Purchasing Department is having a drive against pompous business letters and quotes the following example as an awful warning against "high-hat" English:

"We beg to advise you,  
and wish to state  
That yours has arrived  
as of recent date.  
We have it before us,  
its contents noted;  
Herewith enclosed  
are the prices quoted.  
Attached you will find,  
as per your request,  
The forms you wanted,  
and we would suggest  
Regarding the matter  
and due to the fact  
That up to this moment  
your decisions we've lacked,  
We hope that you will not  
delay it unduly,  
And we beg to remain,  
yours very truly."

### Underground Gasholders

**I**F experiments being carried out by the Cassel Works of General Chemi-

cals Division and the Northern Gas Board on the brinefield near Billingham are successful, an entirely new method of storing gas may be put into practice.

Brine is obtained by boring into rock salt deposits and pumping down water which dissolves the salt, the solution being pumped up. When the cavity reaches a certain size it is abandoned. The present proposal is that instead of leaving the well full of brine, gas should be forced in under pressure to displace the brine and form a vast storage chamber 1000 ft. below ground.

★ ★ ★

What will the advantages be? First, it is estimated that it would cost only about £125,000 to provide storage space of this type for 10 million cubic feet of gas under high pressure, while to build conventional gasholders of the same capacity costs four times as much. Secondly, a number of vast underground storage chambers would form a useful reserve for domestic and industrial users.

I.C.I.'s part in the experiment is to bore a brine well (not yet completed) which will be suitable for gas storage. The brine will be pumped out and used



by Cassel Works as part of their normal operations. A special well is necessary for the experiment because it is doubtful whether the underground formations of the existing wells would be suitable for storing gas under high pressure.

### Magic in the Air

WITH children's Christmas parties in the offing there is magic in the air. But aspiring conjurers should take a word of warning from MR. CHARLES SCOTT, one of Alkali Division's photographers and in his spare time a member of the International Brotherhood of Magicians.

From thirty years' experience of mystifying children at Christmas parties—he started conjuring when he was ten—Mr. Scott has learned one thing at least: that children are the



conjurer's hardest audience. They unmercifully seize on his slightest mistake, whereas adults delight in being puzzled. "The more intelligent the audience," says Mr. Scott, "the more easily they are deceived."

Mr. Scott was bitten by the magic "bug" after a visit to London's then centre of magic, Maskelyne and Devant's. He got down to assiduous practice, vigorously back-palming cards or producing coins from empty air as he walked to school.

Having achieved some skill, he launched it on the public. His first public show, at the age of 14, was for an audience composed entirely of doctors, who proved to be less guileful than he feared. His second was for 500 poor children from Liverpool's slums. Since then he has performed in all kinds of surroundings for all kinds of audiences.

### Cyclone at Witton

NEWS of the "man bites dog" variety was made at Witton in October, when a cyclone was at home to visitors.

Of course, it was a very special sort of cyclone—almost invisible, almost silent and, most remarkable of all, tamed into performing a useful and constructive job.

The cyclone came to Kynoch Works two years ago. The new titanium melting furnaces were proving greedy power consumers, and extra generating capacity was needed. The new boiler and generator had to be extremely powerful for their size, and (because Witton is a residential area) strict control of smoke and dust from the chimney was imperative.

★ ★ ★

The problem was solved by choosing a Babcock and Wilcox cyclone-fired boiler—the first to operate in the United Kingdom. Its spectacular name comes from the rapidly revolving stream of hot air inside the combustion chamber—so fast that it enters at something like 400 m.p.h. and so hot that it would melt a piece of lead instantly.

The powdered coal which meets this "cyclone" is burned within one-hundredth of a second. The hot gas formed by combustion passes into the water tube section of the boiler to continue the process of power production; the ash particles, melted by the fierce heat, drain away into a quenching tank.

★ ★ ★

This is particularly interesting, because cyclone slag—unlike the fly ash produced by conventional firing—is manageable and can be used, for instance, as filler material in road-building. The small amount of dust which escapes from the cyclone is collected on an electrostatic precipitator, so reducing to a minimum the amount which is emitted from the chimney. On test, the dust burden of the cyclone chimney stack was less than 10% of the accepted standard.

The control of the cyclone boiler, which is certainly one of the most efficient boilers in the country, is completely automatic.

### NEWS IN BRIEF

**TO LEAD COMMITTEES.** Sir Alexander Fleck, Chairman of I.C.I., has been appointed by the Prime Minister to be chairman of three committees which are to investigate matters arising from the accident at the Windscale plutonium factory.

**TRIBUTE TO I.C.I. PAINTS.** A Hampshire dairy farmer has named two of his cows 'Dulux' and 'Dulite.'

**ROLLING TECHNIQUE.** A book by Mr. Eustace C. Larke of Metals Division Research Department, *The Rolling of Strip, Sheet and Plate*, has been published recently (Chapman and Hall, £3 3s.).

**RUSSIANS AT DYESTUFFS.** Five Russian technicians recently spent a fortnight at Blackley. They were led by Professor Laptev of the Scientific Research Institute of Organic Chemicals and Dye-stuffs.

**NOT QUITE 50.** Miss Mary M. Myles of Nobel Division's Westquarter factory has retired after 49 years and 10 months' service. She worked for the whole of this time on electric detonator manufacture in the danger area.

**BILLINGHAM HISTORY.** A history of Billingham Division's first ten years, entitled *Billingham—The First Ten Years*, has been published. It was written by Dr. V. E. Parke, Division Intelligence Officer until his retirement recently.

**DUKE'S TOPICS.** Topics arising from the Duke of Edinburgh's Study Conference which have been discussed by works councils at Wilton have produced such useful and important suggestions that a book of them is being compiled.

### METALS DIVISION—NEW JOINT ENTERPRISE

The following statement was issued on 30th October:

The boards of the Yorkshire Copper Works Ltd. and Imperial Chemical Industries Ltd. have reached the conclusion that it would be wise to combine their activities in the copper and copper alloy tube and plate industry in a joint enterprise on the basis of equal participation. They are therefore exploring methods of achieving such a combination.

I.C.I. would contribute its new copper tube factory at Kirkby, Liverpool, which is one of the most advanced in the world, the Allen Everitt copper and copper alloy tube works at Smethwick, Staffs, the plate factory at Landore Works, South Wales, and the Fyfe fittings factory at Dundee.

The Yorkshire Copper Works Ltd. would contribute its large copper and copper alloy tube and fittings works at Leeds, together with its recently established manufacture of plastic tubes; also the tube factory at Barrhead in Scotland, the shell moulding works at Castleford

known as Anson Units Ltd., and the controlling interest in Yorkshire Fittings (Australia) Pty. Ltd.

The plants of the two companies are in many instances complementary, and their utilisation in a joint enterprise would enable production facilities to be used with the utmost efficiency the better to compete in vital overseas markets and in the likely Free Trade Area in Europe.

### NEW APPOINTMENTS

Some recent appointments in I.C.I. are:

#### General Chemicals Division

Mr. J. H. Harris. Power Department Manager.

Mr. H. Shaw. Technical Director.

Mr. G. E. Sutton. Finance Director.

#### Metals Division

Mr. J. Crosbie. Seconded as director, British Association for Commercial and Industrial Education, for two years.

Mr. C. P. Gallimore. Division Safety Officer.

### TRANSFER OF POLYTHENE TO PLASTICS DIVISION

Mr. L. Dobson, who will relinquish his appointment as an Alkali Division director on 31st December 1957, will become a full-time director of the Plastics Division.

Dr. A. W. C. Taylor (Billingham Division) has been appointed Technical Director of the Plastics Division.

Dr. R. G. Heyes (Plastics Division Personnel Director) will also assume responsibility for production in that Division.

Mr. R. H. Dibb (Plastics Division Engineering Director) will succeed Mr. J. E. Braham as I.C.I. Engineering Controller on the latter's retirement in 1958, and Mr. L. Dobson will then become Engineering Director of the Plastics Division.

### THE 'DULUX' STORY (continued from page 403)

and quart packs. From 1953 the demand for pint and half-pint packs has rocketed. Filling millions and millions of cans has been an engineering and management feat of no mean order.

Warehousing, similarly, has undergone a complete change of method—the Slough mechanised paint warehouse holds over a million gallons and is the biggest in Europe. Our fleet of lorries is large, efficient, and most economically used. The blue-green livery and the slogan "Say 'Dulux' to your Decorator" are familiar on every highway. We think that the 'Dulux' can itself has done much to help sales by its shelf appeal.

The seasonal fluctuation in the demand for paint is a cross we have to bear; even indoor painting falls off during winter months. Stocks must be raised to a peak in early spring to satisfy the offtake by merchants and retailers, and our factories are at full bat throughout the summer.

An essential in Paints Division business is that we must "sell from stock"—no painter, professional or amateur, must be kept waiting when he calls for his paint. It is our boast that in every sizable town 'Dulux' is on tap. One enterprising 'Dulux' merchant offered a prize of £50 if he failed to deliver within 24 hours half a dozen tins of 'Dulux' or 'Du-lite' in any colour and of any size. No

### HEAVY ORGANIC CHEMICALS DIVISION

The boards of the Billingham Division and of the Heavy Organic Chemicals Division will be as follows, with effect on and from 1st January 1958:

#### Billingham Division

Mr. W. J. V. Ward\* Chairman  
Mr. W. C. d'Leny\* Managing  
Mr. J. W. Kerr\* Directors  
Mr. E. A. Blench\*  
Dr. B. W. Bradford  
Mr. K. H. L. Cooper\*  
Mr. E. T. Grint\* (visiting)  
Mr. R. A. Hamilton  
Dr. A. M. McKay\*

Mr. P. Mayne\*  
Dr. T. Corlett Mitchell\* (visiting)  
Mr. D. S. Smith  
Mr. J. A. L. Young\*

#### Heavy Organic Chemicals Division

Dr. S. W. Saunders\* Chairman  
Mr. D. M. Bell\* Managing  
Mr. K. W. Palmer Directors  
Mr. J. D. Brown  
Mr. T. B. Clark  
Dr. C. Cockram  
Mr. A. J. Prince\*  
Mr. R. B. Richards  
Dr. J. E. Sisson\* (visiting)  
Mr. J. W. Woolcock  
\* Present Billingham Division director.

### ANSWERS TO CHRISTMAS QUIZ

#### Old Songs

1. Old iron, old iron.
2. Because I'm afraid to go home in the dark.
3. Dilly-dally on the way.
4. A ticket to Spain or having your honeymoon over again.
5. Light the fire.

#### Sport

1. John Davis, the rackets player, by William Hazlitt.
2. David Harris, the Hambledon bowler.
3. The British Isles won the Ryder Cup for the first time for twenty-four years.
4. Aston Villa's.
5. The guides in the first ascent of the Matterhorn in July 1865.

#### General

1. (a) Sherlock Holmes, (b) Professor Higgins, (c) Dr. Johnson.
2. Sibelius.
3. General Sir Henry Havelock.
4. Prime Minister of Eire.

#### 5. Handel.

6. Going out of King's Cross.
7. Association of British Chemical Manufacturers and Inter-continental Ballistic Missile.
8. (1) Balaclava helmet, (2) Raglan coat, (3) Cardigan.
9. D. H. Lawrence—Augustus John's studio.
10. Dickens.

#### Quotations

1. Gibbon (*Decline and Fall of the Roman Empire*).
2. James Whistler (sent down from West Point for failing in chemistry).
3. Sydney Smith.
4. Baedeker.
5. Marcellus in *Hamlet*.

#### Geography, Topography and Travel

1. Norwich—Charing Cross.
2. St. Leonards-on-Sea—Bolton.
3. Hampstead—Detroit.
4. The City of London—Leeds.
5. The City of London—Brussels.

one claimed the prize, so the money was given to charity. 'Dulux' is sold in four popular grades: Gloss, Eggshell, Flat and Undercoat. 'Du-lite' Emulsion Paint is a leading brand and is making excellent progress. Primers, varnish and water paint complete the range.

Colour is of the utmost importance and never flagging interest. Paint must beautify as well as protect—and opinions differ on what is beautiful. We do our best to meet popular taste, and to give help to those who seek it, in choosing schemes of decoration. We run a very large colour advisory department for architects and others concerned with public and industrial buildings. To householders, who number hundreds of thousands, we cannot give specific guidance, but we offer literature and a colour comparator which is an ingenious colour chart that can be used in conjunction with "fixed" home colours such as carpets and furniture.

All in all, we have tried to create an expanding demand for the quality paints made by the Division; good reputation will spread, because time—in years of paint durability—is on our side. We have half a thousand merchants and many thousands of retailers to help us, quite apart from our own technical and commercial people.

What more can we ask?



# City of David

By Clarence Loughnane

Many of the places described in the New Testament remain much as they were almost 2000 years ago. The fields where the angel appeared to the shepherds, the Mount of Olives, Calvary, the Garden of Gethsemane, and "The City of David which is called Bethlehem"—in these places the past has never ceased to live.

OWING to the political situation, the approach to the old city of Jerusalem is nowadays usually through Jericho, and there is no better one for getting into the right state of mind in which to arrive in the Holy City.

As Jericho in the Jordan valley is below sea level, it is a long slow climb all the way. Passing the end of the Dead Sea, so aptly named, the road winds up through the barren hills of Judea, which, with the sun on their yellows and browns, have a definite yet somewhat elusive beauty. Away to the left can be seen a dome over the so-called tomb of Moses and then soon after the Good Samaritan Inn. This is the well-authenticated site of the inn of the parable.

By now the Mount of Olives can be seen, and soon Bethany is reached, after which Biblical sites crowd thick and fast. Here is where Christ met Martha, there the spot where He told the disciples they would find the ass for the ride into Jerusalem, while over there is the tomb of Lazarus.

Then the road turns a shoulder of the Mount of Olives and there—can this be real, those domes and spires within the magnificent encircling walls and gates soaring above the Kedron? Yes indeed, it is Jerusalem the Golden. A moment that is never

forgotten and never fails to thrill, no matter how many times the journey is made.

Now on foot one passes through the huge Gate of Damascus to enter a labyrinth of narrow lanes and alleys, some steeply stepped, all looking alike, full of turns. The first spot to visit at Christmas time is, of course, the Church of the Holy Sepulchre, reached by the Via Dolorosa, the Way of the Cross. This magnificent great church is built on what is generally accepted as Calvary; and its chapels are the sites of the Crucifixion, the parting of the raiment and the tomb. It is thronged by peoples of many nationalities and costumes. Bound by the same faith, they are a reminder of our Lord's instructions: "Go ye therefore and teach all nations."

From here the Dome of the Rock is reached through another bewildering maze of the same tortuous, narrow stepped alleys, lined with tiny shops, crowded with people pushing aside the laden donkeys. No other Eastern bazaar recalls the past more vividly, for here the past has never ceased to live. What was seen by Christ as he went to the Temple to teach is exactly what is seen today.

Unlike most of the sacred spots, which have been covered with churches, Gethsemane is still a quiet,



Photo: C. Loughnane

*From the Mount of Olives, looking eastwards, the view is lifeless and mysterious. In the foreground are the Judean Hills, beyond them the valley of Jordan, the Dead Sea and the mountains of Moab. To the west lies Jerusalem, and it was from here, says the gospel, that "He beheld the city and wept over it."*

informal little garden with small, ordinary flowers growing among the olives as they must have done when the disciples rested there. From the top of the Mount of Olives is a view that is awe-inspiring rather than scenically wonderful, for all around are the places where the Bible story was made.

Eastwards beyond the Judean hills lies the great rift of the Jordan valley and the Dead Sea, with the mountains of Moab rising on the other side. At all times of the year the view is hazy, lifeless, mysterious; the hair begins to creep as the last fascinated look is taken before turning round to where the city of Jerusalem is spread out below. It was from here that the Gospel says "He beheld the city, and wept over it."

But now the afternoon draws on and it is time to think of journeying, even as Joseph and Mary did, "unto the city of David which is called Bethlehem," with a stop at the Shepherds' Fields, where tradition

says that the angel appeared while shepherds watched their flocks by night. Nowadays carols are sung here on Christmas Eve as the sun sets and darkness falls. As the stars come out one by one, the magic of the great feast of Christmas lifts the traveller's weary feet up the long hill into Bethlehem, where he will eat the meal of the people—kabab and bread. On his way he will have passed the Fields of Boaz where Ruth gleaned, and the vineyard which Noah planted—the first on record. Nowhere other than in Bethlehem can wine be drunk so appropriately, so healthily, so cheaply.

The midnight mass with which we are familiar on the radio is that held on 24th December in the Roman Catholic church at Bethlehem. But the Greek Orthodox Church, with a different calendar, holds its Christmas Eve service in the old basilica on 11th January. This is the more memorable service.

The beautiful columns of Justinian's church, lit only by oil lamps, form the perfect setting for the





At the crest of this hill is the reputed site of the Garden of Gethsemane, containing a tomb that is said to be Joseph of Arimathea's. Gethsemane is still a quiet, informal little garden with flowers growing among the ancient olive trees. The tomb in the left foreground is Absalom's.



A street in Bethlehem, with flights of steps probably looking much as they were nearly 2000 years ago. At Christmas Christians from Israel and diplomats are allowed to pass into Bethlehem to attend services in the churches.

pageantry of the Eastern church. Everything—columns, vestments, ritual—is as it has been since the very early days of Christianity. An awful sense of unreality gives way to the realisation that this is the past, to strange sensations that time is utterly gone as the dignitaries move by in solemn procession. The gold and silver of their crowns, the rich brocade vestments against a background of priceless ikons,

the multitudinous choirboys, each with a candle, the hypnosis of the incense, and the paeans of majestic praise coming not only from the depths of men's throats but from the depths of their hearts—these things are deeply moving. It is midnight, the bells joyously peal the glad news as one comes out into the keen, cold air, the stars are more brilliant. It is Christmas Day—in Bethlehem.





*Siamese Dancer*

*Photo by W. B. Rothwell, I.C.I. (Malaya)*